MEET THE NCR
420·2
OPTICAL READER . . .

. . . your most economical path to electronic data processing . . .

752 011 9 Y 70077.700 06290697172 W 2|
752 011 9 Y 70077.700 06290697172 W 3|
752 011 9 Y 70077.700 06290697172 W 2|
752 011 9 Y 70077.700 06290697172 W 3|
752 011 9 Y 60066.600 06290697172 W 4|
752 011 9 Y 60066.600 06290697172 W 5|
752 011 9 Y 60066.600 06290697172 W 6|
752 011 9 Y 60066.600 06290697172 W 7|
752 011 9 Y 60066.600 06290697172 W 8|
752 011 9 Y 50055.500 06290697172 W 9|
752 011 9 Y 50055.500 06290697172 W 10|
752 011 9 Y 50055.500 06290697172 W 9|
752 011 9 Y 50055.500 06290697172 W 4|

BCDE Y 1109   98765 90.21|
BCDE Y 1109   98765 90.21|
BCDE Y 1109   98765 90.21|
BCDE Y 1109   98765 90.21|
BCDE Y 1109   98765 90.21|
BCDE Y 1109   98765 90.21|
BCDE Y 1109   98765 90.21|
BCDE Y 60119   98765 90.21|
BCDE Y 1109   98765 90.21|

0   93.506 W|
0   12325.608 W|
3   44.00 Y W|
6   65.00 Y W|
9   27.55 Y W|
8   65.00 Y W|
0
0   71.556 W|
0   5 1 069.098 W|
2   35.00 Y W|
9   228.20 Y W|
5   1058.00 Y W|
7   642.00 W W|

THE NCR 420-2

Optical Reader lowers
Total System processing costs
for ALL lines of business

HERE'S WHY!

IT'S ECONOMICAL . . .

the only media you'll need for NCR "optical" processing are inexpensive journal tapes from sales registers, accounting machines or adding machines. No other "in-between" equipment is required to convert original entry data into computer language.

IT'S UNIVERSAL . . .

the NCR 420-2 is not restricted to any one application. Because it reads data from sales registers, accounting and adding machines, the NCR 420-2 can be applied by any line of business seeking an economical processing path between the original entry and computer processing.

IT'S EASY TO USE . . .

operating the NCR 420-2 is simplicity in itself. Highly skilled computer personnel are not required. The entire reading process is controlled by six operating buttons. And because the NCR 420-2 is internally programmable, tape editing becomes automatic, "inhibit" functions are automatic and there are four output programs available for variable output formats.

IT'S COMPLETELY FLEXIBLE . . .

the NCR 420-2 provides "off-line" processing for creation of either punch paper tape or cards . . . Or it can be used "on-line" reading data directly into your computer for immediate processing. These processing options mean that the NCR 420-2 will adapt itself to your system and your system requirements.

Now . . . let's take a look at some
of the outstanding features of the NCR 420-2

EASY JOURNAL TAPE LOADING PROCEDURES

Journal tapes are loaded into the NCR 420-2 in approximately 10 seconds. The Transport mechanism accommodates journal tapes from 1-5/16" to 3-1/4" in width.
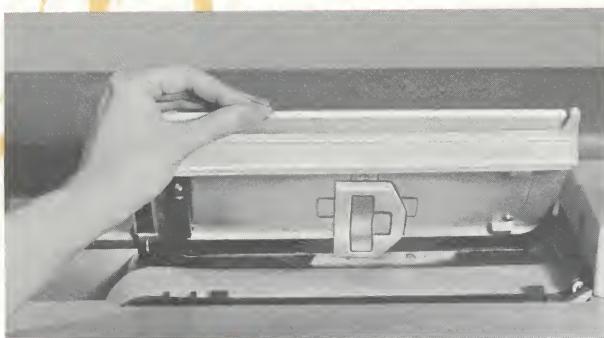
You simply place the journal tape into the NCR 420-2 (shown above) as you receive it from the input equipment. There is no need to rewind the journal tape.

The journal tape is automatically secured to the take-up reel. Just close the cover and reading begins.

READS UP TO 3,120 LINES PER MINUTE

At its rated speed of 52 lines per second, the new and improved NCR 420-2 reads up to 1,560 characters per second. And because the NCR 420-2 automatically adjusts its "electronic eye" for print variations, it can read dim and uneven print, as well as print that's crisp and clear. The NCR 420-2 also reads adding machine journal tapes printed in red and black as well as journal tapes from sales register and accounting machines printed in purple. The NCR 420-2's ability to adjust its reading tolerances provides many advantages. It means fewer delays in data processing, but more important it means you get more "optical" throughput for your processing dollar. These are highly significant advantages to consider in any data processing system.

CRISP AND CLEAR

DIM AND UNEVEN
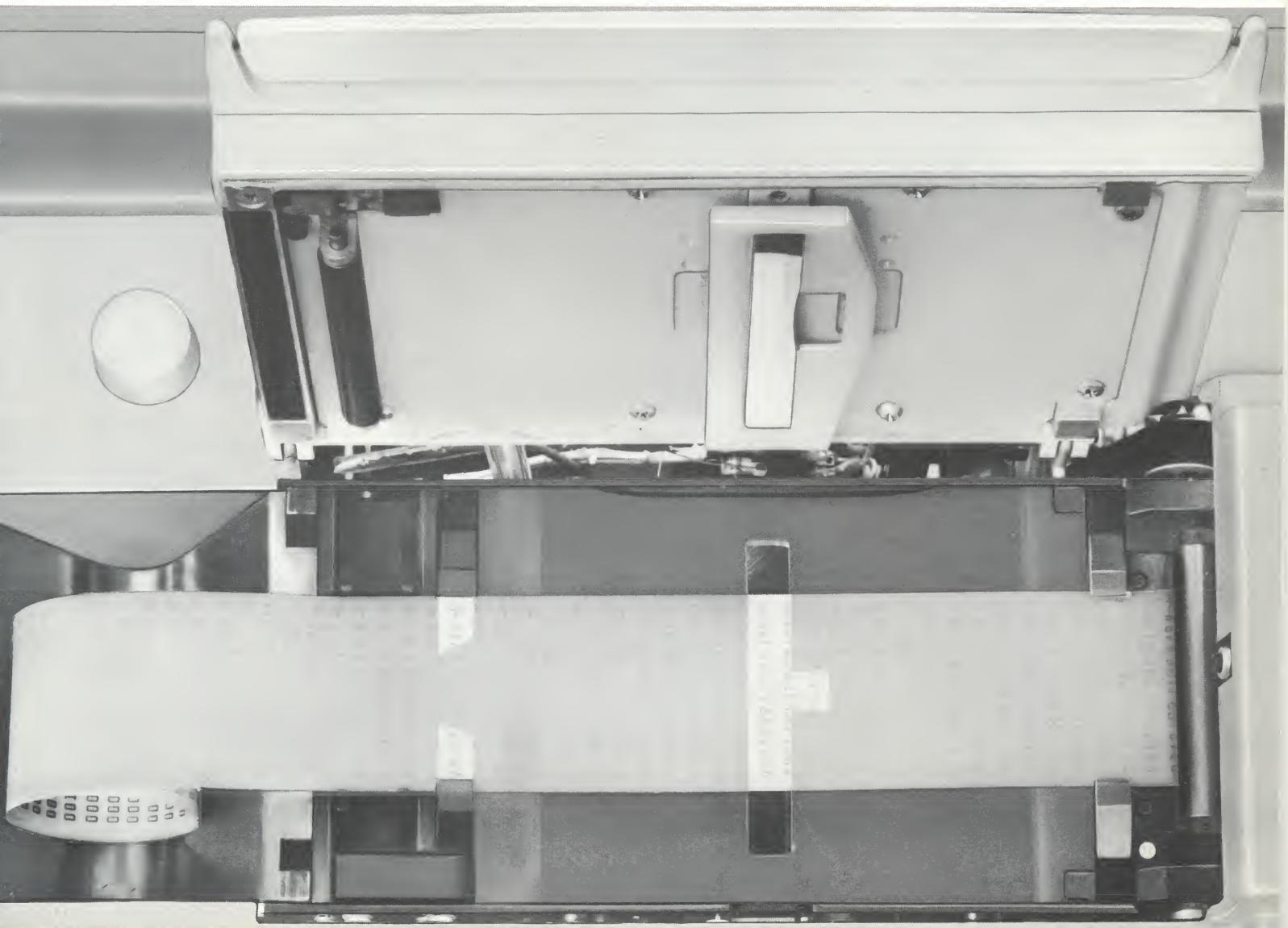
PROGRAM BOARD PROVIDES
AUTOMATIC PROCESSING BENEFITS

Internal programming permits the NCR 420-2 to perform many functions without operator intervention. Individual characters or entire print lines can be automatically "barred" from entering the processing system. This reduces the number of characters that must be handled during a validation run by the computer. Another processing bonus provided by the NCR 420-2 is variable length output programs. Data can also be programmed for output in any sequence desired, and regardless of journal tape format, can be emitted either high order or low order digit first. These automatic processing benefits save both computer programming time as well as computer processing time.

PROVIDES
"ON-LINE" OR "OFF-LINE"
PROCESSING OPTIONS

OUTPUT UNIT   REJECT CHARACTER FILL   310/315 UNIT SELECT

The two dials, shown above in yellow, are used to determine the destination of data read by the 420-2. For the creation of punch paper tape or cards, the dial is set to 371. For direct "on-line" processing, the dial is set to either 310 or 315. If more than one NCR 420-2 is used "on-line" simultaneously, the Unit Select dial is used to assign each 420-2 a peripheral number.

Electronic
RE-SCANNING
# FEATURE saves valuable processing time

Electronic re-scanning greatly reduces the number of lines that would normally be rejected and require special re-entry procedures. When unable to recognize each digit or symbol as a valid "optical" character, the NCR 420-2 electronically re-scans the entire line up to seven times before reporting a reject. With each re-scanning, the 420-2 automatically adjusts its reading tolerances. In the majority of cases, the NCR 420-2 is able to recognize each character in a line thus reducing the number of lines rejected. NCR's electronic re-scanning feature saves processing time both at the computer level as well as in reducing the number of print lines that have to be handled by data re-entry procedures.

When unable to identify every character, the NCR 420-2 provides three re-entry options.

1. The NCR 420-2 automatically marks the "unread" line (on back of tape) and continues to read the rest of the journal tape. With this procedure, a manual entry of the "unread" line is posted on an input machine and re-entered into the system.
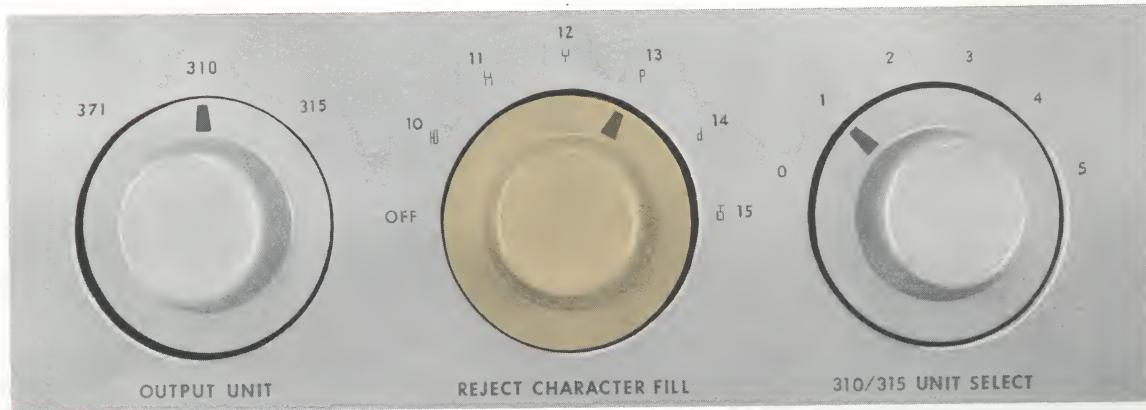

2. An "optical" character can be selected on the Character-Fill dial. When unable to read a digit, the NCR 420-2 automatically emits the "selected" character to replace the unreadable digit. Disposition of the unreadable digit can be determined by the computer . . . or it can be handled by "off-line" procedures.
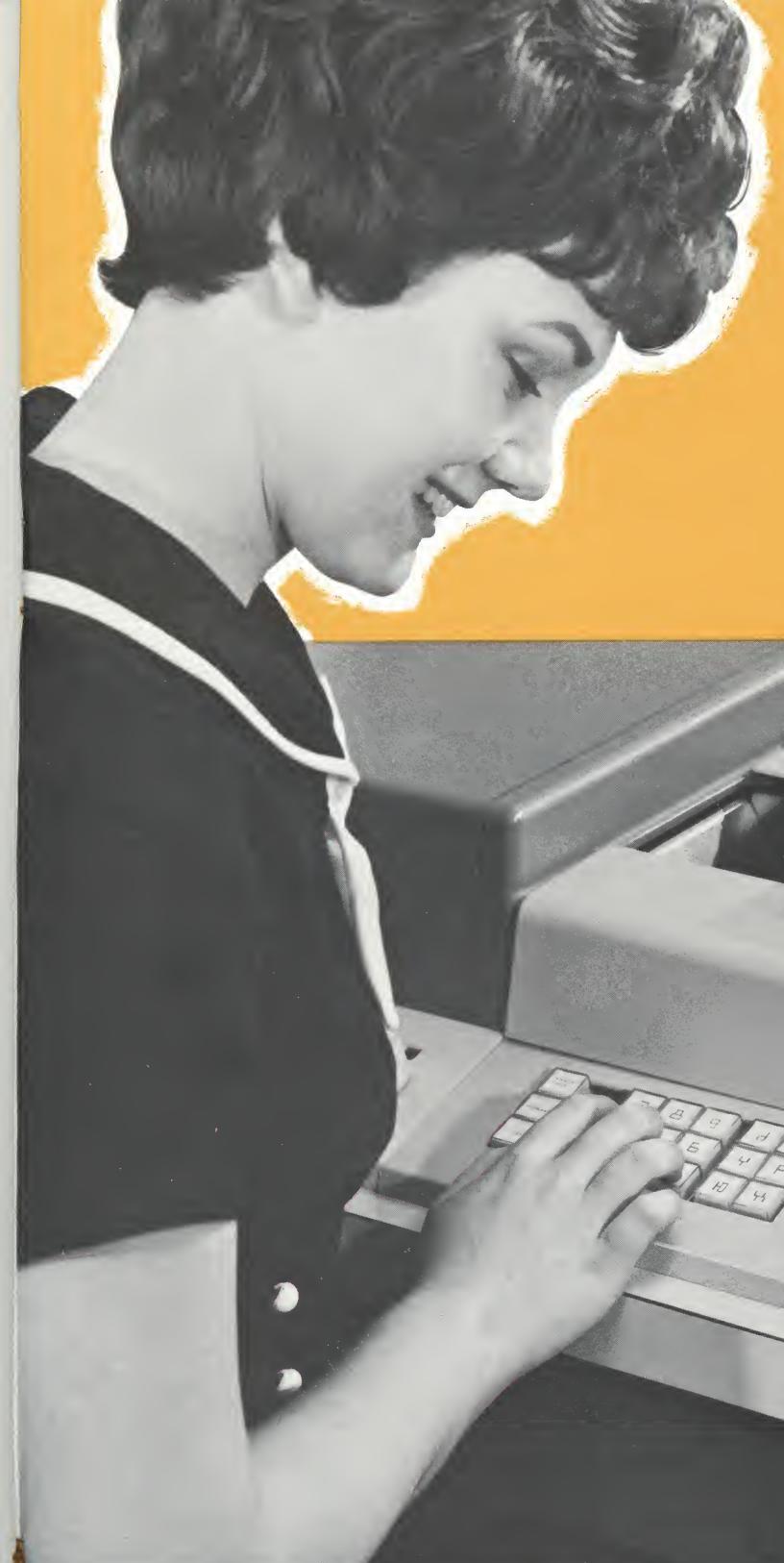
3. The NCR 420-2 provides an exclusive "on-line" technique for entering any or all characters involved in a reading-reject. This includes rejects caused by sub-standard print on the journal tape or characters on a print-line that have been smudged. NCR's exclusive re-entry technique permits transmission of ALL data to a processing system and completely bypasses the necessity for any "off-line" re-entry procedures.

When a reject occurs, the entire print-line is magnified 1½ times and displayed on the re-entry console. A light appears over the unreadable character enabling the operator to quickly locate it and enter it through the re-entry keyboard in a **one** stroke operation. With this procedure, re-entry time is reduced to an absolute minimum because the operator only enters the "unreadable" character or characters . . . not the entire line.
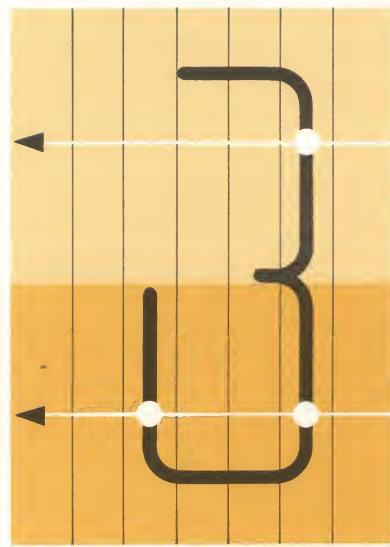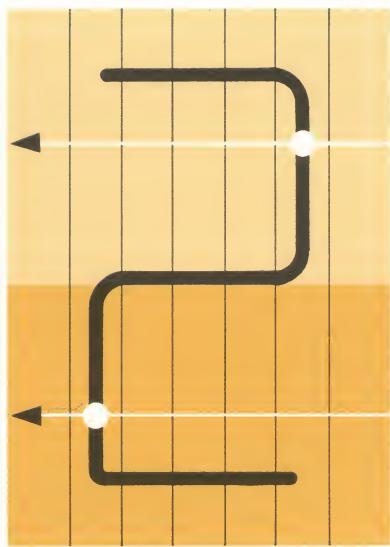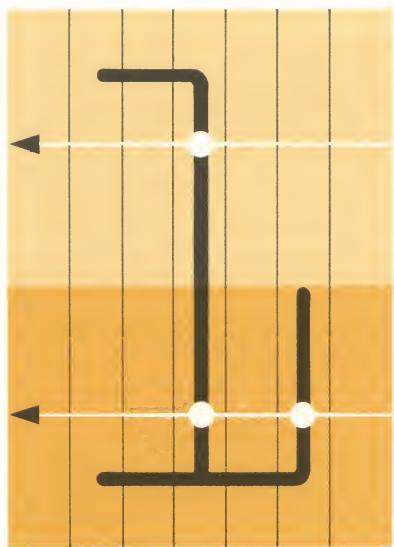
0	0	1	0	0		0	0	0	0	1		0	0	0	0	1
0	0	1	0	1		1	0	0	0	0		0	1	0	0	1

DIRECT CHARACTER RECOGNITION

Each "optical" character is framed within five upper and five lower search zones. Simultaneously, the "electronic-eye" scans both the upper and lower parts of a character seeking the presence of a vertical line. The presence of a vertical line triggers an electrical impulse that generates a binary code. Each "optical" character is uniquely styled to generate its own distinctive code. For example, the digit "3" is identified by impulses in the upper and lower parts of the first zone and an impulse in the lower part of the fourth zone. By using both the upper and lower parts of each character for recognition, NCR provides a bi-code reading technique known as stroke analysis. And this bi-coding technique enables the NCR 420-2 to check and double check each character to assure an accurate reading of all data from a journal tape.

752 0 4 19 4 30033.300 06293697472 H 4
752 0 4 19 4 30033.300 06293697472 H 3
752 0 4 19 4 30033.300 06293697472 H 2
752 0 4 19 4 30033.300 06293697472 H 1
752 0 4 19 4 30033.300 06293697472 H
752 0 4 19 4 30033.300 06293697472 H
752 0 4 19 4 30033.300 06293697472 H
752 0 4 19 4 30033.300 06293697472 H
752 0 4 19 4 30033.300 06293697472 H 7
752 0 4 19 4 30033.300 06293697472 H 8
752 0 4 19 4 30033.300 06293697472 H 9
752 0 4 19 4 30033.300 06293697472 H
752 0 4 19 4 30033.300 06293697472 4
752 0 4 19 4 30033.300 06293697472 H
752 0 4 19 4 30033.300 06293697472 H
752 0 4 19 4 30033.300 06293697472 H 6
752 0 4 19 4 30033.300 06293697472 H 5
752 0 4 19 4 30033.300 06293697472 H 4
752 0 4 19 4 30033.300 06293697472 H
752 0 4 19 4 30033.300 06293697472 H
752 0 4 19 4 30033.300 06293697472 H
752 0 4 19 4 30033.300 06293697472 H 4
752 0 4 19 4 30033.300 06293697472 H 5
752 0 4 19 4 30033.300 06293697472 H 6

Your Best "Optical" approach
to data processing

There are many "input roads" to data processing. But absolutely none offers the economy . . . the simplicity . . . or processing options that you get with the NCR 420-2. Journal tapes — printed by NCR adding machines, accounting machines and sales registers are the only input media required for "optical" processing.

In addition to economies at the input level of your system, the NCR 420-2 also provides many other economies at the processing level. You do not need special people in the processing room just to create input media . . . nor will you require highly skilled computer personnel to process "optical" input. And because the NCR 420-2 is internally programmable and provides so many automatic processing options, many processing steps are completely automatic. These processing benefits add up to impressive savings.

For more information about how the NCR 420-2 will help reduce your Total System processing costs, call your nearby NCR branch office.

SPECIFICATIONS

Class 420-2 Optical Journal Reader

READING SPEED

52 Lines per second (up to 32 characters per line)
1664 characters per second

TRANSPORT

Paper Dimensions:

	Minimum	Maximum
Width	1-5/16"	3-1/4"
Length	10"*	1560"

*Includes an 8" leader

Load time: Approximately 10 seconds including unloading tape just read and loading new tape
Paper Speed: 13" per second
Automatic Back-up: One to seven automatic back-ups. 40 milliseconds per back-up and re-read

COLUMN POSITIONS

1 to 32 character positions per printed line. Optical print and conventional machine print can be on same line. Any 32 optical characters can be placed into memory

MEMORY

A 32 character core memory

OUTPUT CONTROL

Programs: Four programs of 16 steps each
Longer programs possible by selective wiring of program reset
Program Selection: Possible to designate any column(s) for program selection
Symbol Emission: Any of ten decimal digits or the six non-numeric symbols may be emitted under program control

OUTPUT CODING

5 channel code: 1-2-4-8 odd parity, binary coded decimal

TIMING

Scan Time: 19 milliseconds to scan and place a line in memory
Start Time: Continuous if 420 memory is emptied in 3 milliseconds.

TRANSFER RATE

Class 315 —10 microseconds per character
Class 310 —33 microseconds per character
Class 390 —1.67 milliseconds per character
Class 371-1—9.1 milliseconds per character

DIMENSIONS

45¼" high, 64¼" long, 29" deep
935 lbs

POWER REQUIREMENTS

103-127V, 60 CPS, Single Phase,
50 Amperes

OPERATING ENVIRONMENT

Between 64 and 78 degrees F
40-50% Relative Humidity

THE NATIONAL CASH REGISTER COMPANY, DAYTON, OHIO 45409